

ABSTRACT OF THE DISCLOSURE

A pump includes an impeller, a stator, and a plurality of magnets forming bearing poles coupled to a selected one of the stator or the impeller. The pump further includes a plurality of shorted coils coupled to the other of
5 the stator and the impeller. The plurality of bearing poles and shorted coils co-operate to form an electrodynamic bearing during rotation of the impeller. The electrodynamic bearing supports the impeller either axially or radially during operation of the pump. Hydrodynamic bearing surfaces are provided for generating a hydrodynamic bearing between the impeller and
10 stator. The plurality of magnets may comprise a plurality of distinct magnetic elements or a single element comprising a plurality of distinct magnetic domains. The plurality of distinct magnetic elements or domains may be arranged to form a Halbach array.